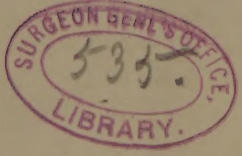
Clarke

(E. L. H.)

Contributions to

renal surgery



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PART I.—ESSAYS, MONOGRAPHS, AND CASES.

Contributions to Aural Surgery. Polypi and Fungus of the Ear. By Edward H. Clarke, M. D., Boston, Mass.

Morbid growths in the ear-passages are of frequent occurrence. They are found in both sexes and at all ages. They vary in size, character, position, and appearance. Sometimes they are not larger than a small pea; and sometimes they completely fill up the external meatus, and even project into the cavity of the concha. They often consist almost entirely of epithelium cells, without any distinct fibrous tissue or envelope; and sometimes present the appearance of fibrous tissue, with only a slight intermingling of epithelium cells. Rarely, they are nothing more than cysts, which contain a little liquid; and still more rarely, are small, pedunculated, fleshy growths, which neither result from nor produce any discharge. Occasionally they are malignant in their character; but instances of malignant growths in the ear are exceptional. They may be found in any position—from the cavity of the tympanum, to the cerumenous glands—and may sprout from any of the tissues of the external, or middle ear. Their appearance is as various as their character, position, and size. They may be lobulated or smooth; pedunculated or with a large base; globular or elongated, or irregular.

At the present time I propose to consider only those growths which are of a non-malignant character.

These growths may be naturally divided into two classes, which I shall call polypus and fungus. The former term is used as indicative of distinct tumors, which may grow from any part of the external auditory meatus, and which are generally of an epithelial or fibrous character; while by fungus I understand what Dr. Wilde, of Dublin, in his late excellent work on Aural Surgery, describes as "those vascular and granular masses which generally grow either from diseased bone, or after the destruction, in whole or in part, of the membrana tympani, and the attachments of which are to be found principally at the very bottom of the auditory passage in the tympanum." *

The causes of polypus and fungus have not yet been fully determined. Any long-continued irritation in the ear, particularly otorrhœa, appears in a large majority of instances, to induce such growths. When a discharge from the ear is neglected for a considerable period, and purulent matter is allowed to accumulate in the meatus, so that its walls are constantly bathed with an offensive secretion, polypus or fungus is almost sure to sprout and grow. An appropriate nidus is thus prepared for their production, and they grow from it like weeds from rank soil. This, however, is not always the case. I have known polypus to take root and grow luxuriantly, where there had been no apparent antecedent disease. "Beneath the increased tendency to vegetations (erhöten vegetationsprozesse) which leads to the production of polypus, there lies," says Martell Frank, "as the foundation, a certain inflammatory condition; hence, whatsoever may induce inflammation of the glandular tissue of the meatus, or catarrhal inflammation of that passage, may likewise generate polypus." †

Polypi of the ear have been variously classified by different authors. Some have described them according to their shape and outward appearance, as pear-like, globular, &c.; others according to their position, as polypi of the glandular tissue, of the membrana tympani, of the cavity of the tympanum, and the like. Others again have described them as the result or complication of some other disease; for example as one form of chronic inflammation of the glandular tissue. Practically, these various classifications are not of much use. If any classification is necessary, it would, perhaps, be best to employ one based on the microscopic characters of such growths. ‡

* Practical Observations on Aural Surgery, &c. By William R. Wilde, M. D., etc., etc., of Dublin. Eng. edition, p. 416.

† Martell Frank. Erkenntniss und Behandlung der Ohrenkrankheiten, s. 253.

‡ Mr. Wilde, in the work already cited, describes six varieties of polypi, viz: ovoid and attached by a peduncle; lobulated and friable and gelatinous; lobulated and fibrous and firmly attached; fibrous, with a large base and of an uniform surface; pearıform, or pear-like; and malignant polypus. Mr. Toynbee, of London,

So far as I have noticed, polypi exhibit under the microscope three distinct characters. They consist either of epithelial cells, in process of development, mixed with a little fibrous tissue; or of fibrous tissue with some epithelial cells; or of cysts. The last form is rarely met with.

The first class, or epithelial growths, may occur in any part of the meatus; but, in a large majority of cases they are found in the glandular tissue. They are usually of a bright red color, and are highly vascular. After removal, however, the blood-vessels empty themselves, and the polypi partially collapse, and assume a white or grizzly look. They are not tender to the touch of a probe, except near the root; at this part they are often extremely sensitive. A slight touch frequently makes them bleed, and when extracted the root bleeds freely. They are sometimes attached by a broad base, and sometimes by a narrow one. They usually grow from the glandular tissue, but sometimes spring from the walls of the meatus, near the membrana tympani; they occasionally sprout from the sides or bottom of a sinus, or cul-de-sac, which has been eaten by ulceration into the long walls of the passage, or mastoid cells; and they sometimes grow from the cavity of the tympanum. Their shape and size are irregular—they may be long and smooth; or lobular, with deep furrows or sulci in them; or with various projections, like arms; or composed of one large, irregular mass. These are what are generally described by authors as gelatinous and vascular polypi. The only certain method of recognising them, is by an examination with the microscope. When thus examined, they exhibit small nucleated epithelial cells. These cells may be elongated, fusiform, or conical. The nuclei may be seen both isolated and crowded together in groups, and they are generally mixed with some fibrous tissue. The epithelial cells, however, largely predominate. The annexed drawing, made for me by my friend, Dr. John C. Dalton, jun., of New York, from a specimen under the microscope, gives an excellent idea of the microscopic characters of an epithelial polypus.

A fibrous polypus presents, externally, a somewhat different appearance

who has lately written a series of articles on polypi of the ear, in the London Medical Times, describes three varieties of polypus. The first is the vascular polypus, "of a red color, plentifully supplied by vessels, and so soft that, upon being taken hold of by a pair of dressing forceps, it breaks up, and blood escapes from the lacerated surface. It is composed of small, rounded cells, and its surface, which is sometimes covered by ciliated epithelium, is very smooth and shining." This is the same as what I have described as an epithelial polypus. The second variety is the gelatinous polypus, "a name given to it from the soft, jelly-like appearance presented by its free portions." Mr. Toynbee's third form is called the "globular, vascular polypus."

from an epithelial one. It is more regular in its form, apparently less vascular, and firmer to the touch. It does not usually bleed when touched, and when extracted the root bleeds moderately. It rarely attains to the size which an epithelial polypus often reaches. It is sometimes, though very rarely, attached to the membrana tympani, particularly along the course of the manubrium mallei. It more generally grows from some portion of the outer half of the meatus. I have never met with one which was rooted in the cavity of the tympanum. It is often semi-transparent, and does not collapse much after extraction. Examined under the microscope, its substance exhibits indistinct fibrous tissue, and sometimes bundles of fine parallel fibres, with groups of nucleated fibres and nuclei, which precede the formation of fibrous tissue. Interspersed with these may be seen spindle-shaped cells, and some epithelial tissue. The following drawings (Figs. 2, 3, and 4), which were taken from

Fig. I.—Epithelial cells of a polypus from the ear.

Fig. II.

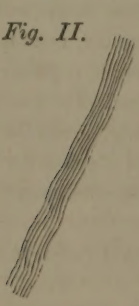
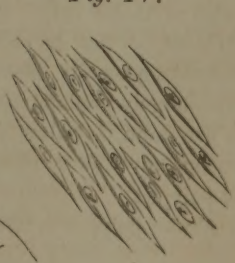


Fig. IV.



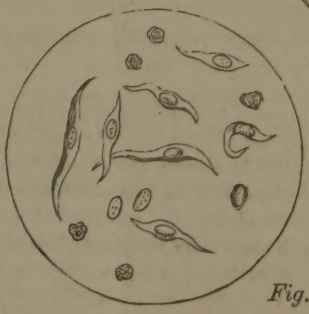


Fig. III.

Fig. II.—Fine parallel fibres of fibrous tissue, from a polypus of the ear.
" *III.*—Spindle-shaped cells, and nuclei, from the same.
" *IV.*—Group of these cells, from the same.

specimens examined for me by Dr. Dalton, of New York, and Dr. John Bacon, jun., of Boston, exhibit some of these appearances. Unlike an epithelial growth, some parts of a fibrous polypus often remain infiltrated with blood after extraction. The greater regularity of its form, firmness of consistence, and less vascular tint, serve to distinguish it from an epithelial polypus; but the microscope alone can determine to which class it belongs.

Another characteristic of polypi is, a strong tendency to reproduce themselves after extraction. It is frequently a matter of great difficulty to prevent a polypus which has been excised, from growing afresh from the root. In this respect, however, there is a marked difference between the two classes above mentioned. An epithelial growth has an inveterate tendency to reproduction; whereas, a fibrous one is often eradicated by simple excision. I do not yet possess observations enough, to make this statement absolutely. But up to the present time, I do not find among my notes a single instance of a fibrous polypus which has reappeared, after the growth has been excised and its root once cauterized. Epithelial growths, on the contrary, have in most cases required active and persevering treatment to destroy them. If future observations should prove that a fibrous polypus in the ear is not readily reproduced, while an epithelial one sprouts luxuriantly from the root, an important practical fact is added to our knowledge of these growths.

The third class of morbid growths to which I have alluded are denominated cysts. They are usually small tumors, elastic to the feel, spherical, and attached by a narrow neck.

Their interior is filled with a reddish fluid, which contains blood-corpuscles and epithelial cells and nuclei, in every stage of development. These cysts are not sensitive to the touch of a probe, and do not bleed easily when touched. They are generally attached to the external third of the meatus, and grow from the dermal or glandular tissue. They are composed of two membranes, an outer or investing membrane, and an inner or lining one. They can be removed with ease by some of the means hereafter described. They appear to be in a considerable degree independent of any antecedent disease, and may, or may not be complicated with deafness. The two previous kinds of polypi are accompanied with otorrhœa, and *sometimes* are the cause of it. Cysts rarely produce any discharge from the ear. Like fibrous polypi, when removed and the root cauterized, they do not readily grow again.

The otorrhœa, to which I have just referred, is one of the most disagreeable attendants upon polypoid growths. It is of a muco-purulent character, often offensive, and always disagreeable to the patient and to others. It varies in amount, from a slight and occasional running to a copious and constant discharge. It may proceed from the polypus itself,

or from the adjacent parts which are irritated by it. Of course, all attempts to arrest the discharge are unavailing, excepting those which lead to the extirpation of the polypus. It should be borne in mind, however, that a polypus is often the result of a neglected otorrhœa, and consequently that the destruction of the growth is only one step towards the arrest of the discharge.

Fungus growths are frequently to be met with at the bottom of the auditory passage, and in the cavity of the tympanum. Like polypus, they are usually the result of a neglected running from the ear. Their microscopic characters resemble those of an epithelial polypus. They are, however, more irregular in shape, break and bleed more readily when touched, and are more highly vascular. Attempts to remove them directly by the aid of instruments are usually fruitless; for they break and give way in the grasp of the instrument itself. They resemble what the French call "vegetations charnues." They sometimes may be seen growing from the bony parts of the meatus, when caries has taken place, and also sprouting from any fissure, or ragged ulcer that exists in the ear. Their more common position is in the cavity of the tympanum, when the membrana tympani has been destroyed. There they may be seen, pushing their vascular heads through the perforation of the membrane (which always exists in these cases), like a crop of mushrooms from a decayed trunk.

The degree of deafness which accompanies polypus and fungus of the ear is variable. It is sometimes so great as to amount to complete cophosis, and sometimes so slight as to interfere very little with the patient's convenience. In most cases, however, it is decided. The loss of hearing is in proportion to the extent of disease. If the membrana tympani is uninured, and the polypus grows from the external portion of the meatus, and has not existed for any length of time, the sense of hearing is not much interfered with. When an opposite state of things exists, and the tissues of the ear as well as the membrana tympani are diseased, there is marked, though rarely entire deafness; and the removal of the polypus will not remove the deafness.

The prognosis in these affections, like the degree of deafness, is variable. When a polypus grows from the dermal or glandular tissue of the meatus, and particularly when it is of a fibrous character, the prognosis is in every way favorable. When, however, polypus or fungus grows from the periosteum, or from diseased bone, or from the cavity of the tympanum, or from the mastoid cells, the prognosis is doubtful. The gravity of it increases in proportion to the character and extent of the disease with which the polypus is complicated.

Let us now pass to the treatment of these growths.

The first and indispensable step towards any safe and judicious treatment

of them consists in obtaining a distinct view of the growths themselves. For this purpose nothing can take the place of clear sunlight The light of a cloudy day is not sufficient; and no artificial light that I have yet seen, can be used as a substitute for the sun's rays. The syringe, probe, and speculum, must likewise be used, as circumstances may direct, to clean the auditory passage, to bring it into view, and to feel of the growth. In order to obtain the utmost possible assistance from the sun, I am in the habit of employing a reflector, such as is herewith represented in Fig. V. It consists of a wooden base, rendered massive by the addition of lead, an upright standard, a projecting arm, and a mirror. The mirror is attached, by a universal joint, to the arm, and the arm is attached, by a slide, to the standard. The mirror may thus be elevated, or lowered, by means of the slide, which is fastened with a screw, and any angle given to the reflected rays by the universal joint at the extremity of the arm. By means of the reflector, the rays of sunlight are thrown into the ear of the patient, in a direction either parallel with the eye of the operator, or at any angle or elevation which he may wish. It will be readily seen, that by this simple means, operations upon the ear are greatly facilitated; and the inconvenience obviated of bending a patient's neck almost to breaking, in order to make the rays of sunlight fall directly into the ear. The necessity of using some kind of a speculum for the ear is so apparent, that its importance need not be insisted upon.

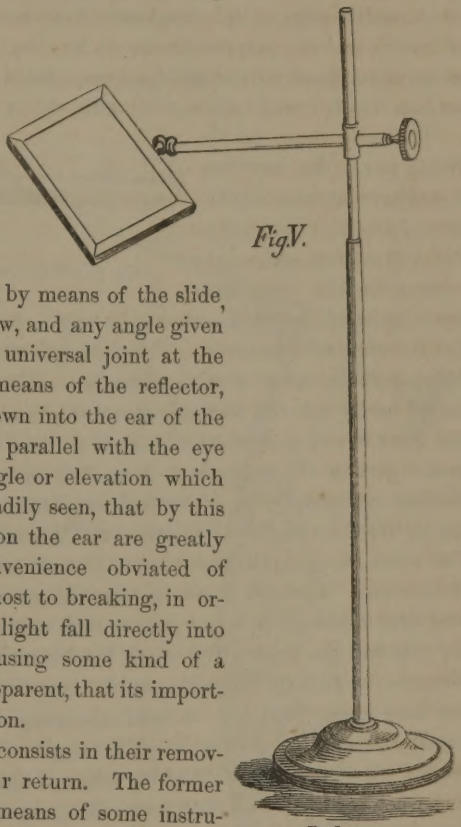


Fig.V.

Reflector.

The treatment of polypi consists in their removal, and the prevention of their return. The former should be accomplished by means of some instrument, adapted to the extraction of a polypus; and the latter, by means of caustics and astringent washes. It is not necessary to notice all the various instruments that have been invented and used for this purpose. I shall content myself by simply noticing two or three, which are the best.

Before describing them, however, let me remark that it is well to use, for a few days, before attempting the removal of a polypus, some astringent

solution. This will contract and harden the growth, and render it much less likely to break up when seized. A solution of alum, or of the acetate of lead, or of the sulphate of copper, or of tannin, may be used for this purpose. Usually, I select the acetate of lead, and direct a solution of this salt, of the strength of 10 or 12 grains to the ounce, to be instilled into the meatus 2 or 3 times a day, for several days. When, however, the polypus is firm to the touch and does not readily bleed, its removal may be attempted at once.

A modification of the wire snare which was first proposed by Mr. Wilde, of Dublin, and the polypus forceps of Mr. Toynbee, are the two best instruments of the kind with which I am acquainted. I have not yet met with a polypus which I could not remove with one or the other of them.

The wire snare of Mr. Wilde (with the modifications I have introduced) consists of a wire, a steel bar, a slide and ratchet, with a convenient handle. The steel bar is $5\frac{1}{2}$ inches long; $2\frac{1}{2}$ inches of its length are square, and the remainder is round. The slide and ratchet are adapted to the square portion of the bar. The slide is moved backwards and forwards by means of a trigger, and fixed in any desired position by the ratchet. The square portion of the bar is $\frac{1}{6}$ of an inch square. Its smallest extremity is $\frac{1}{16}$ of an inch in diameter. A cap $\frac{1}{12}$ to $\frac{1}{8}$ of an inch in diameter, covers this extremity. Two holes are made through the cap, one on each side of the bar. Through these holes a delicate silver or steel wire is passed, in such a way as to form a loop of any required size beyond the cap. The free ends of the wire are fastened to the slide, which may be moved and fixed in any position. A handle is fastened to the largest extremity of the bar at right angles with its length. A simple inspection of the annexed figure will give a better idea of the instrument than any description. The difference between this instrument and Mr. Wilde's consists in the handle, which is placed at right angles with the bar so as not to obstruct the light, and in the slide with the ratchet and trigger. The essential character of the instrument, however, is the same with that of Mr. Wilde. The application and advantage of it is apparent. The loop of wire can, by a little manipulation, be passed beyond and around a polypus which cannot

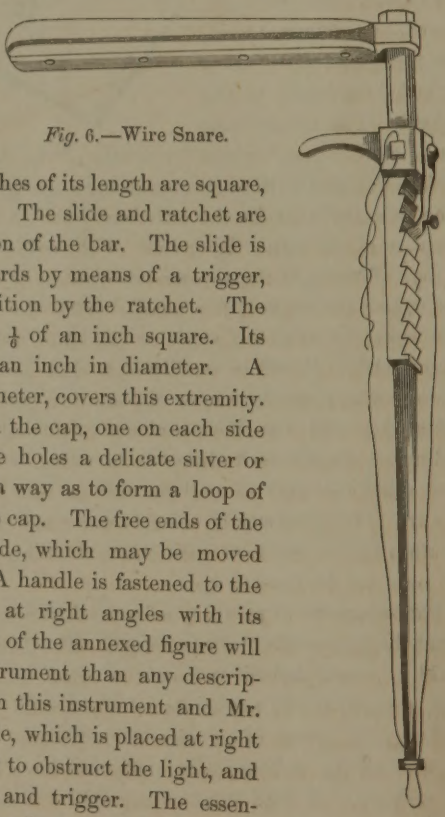


Fig. 6.—Wire Snare.

be readily grasped by other instruments. As soon as the polypus is so surrounded, the trigger is pulled back, and the growth is completely ensnared. When the polypus is thus within the grasp of the instrument, it may be torn out by pulling the whole instrument, polypus and all, out of the ear, or it may be excised. Excision is accomplished by pulling the trigger with the slide back, while the bar remains fixed. In this case, the wire acts the part of a circular cutting instrument, and the cap at the extremity prevents the growth from slipping out of the loop of wire. This instrument is an exceedingly ingenious one, and much credit is due to Mr. Wilde for its invention.

Polypi which cannot be readily extracted by the wire snare, can be seized and torn out by the polypus forceps of Mr. Toynbee, which are represented in figure 7. The construction of the instrument is apparent from the figure. The two blades of the forceps are enclosed by a long slide. When pressure is made upon the button at A, the force is transmitted through the handle to the slide at B. When the slide is thus pushed down, the blades at C are firmly closed. This instrument is convenient for the purpose of grasping polypi of small or moderate size, which are attached to any part of the meatus or membrana tympani. Polypi of larger size are more easily extracted by the snare. With these two instruments in his possession, the aurist will not find much difficulty in taking rom the ear any kind of morbid growths.

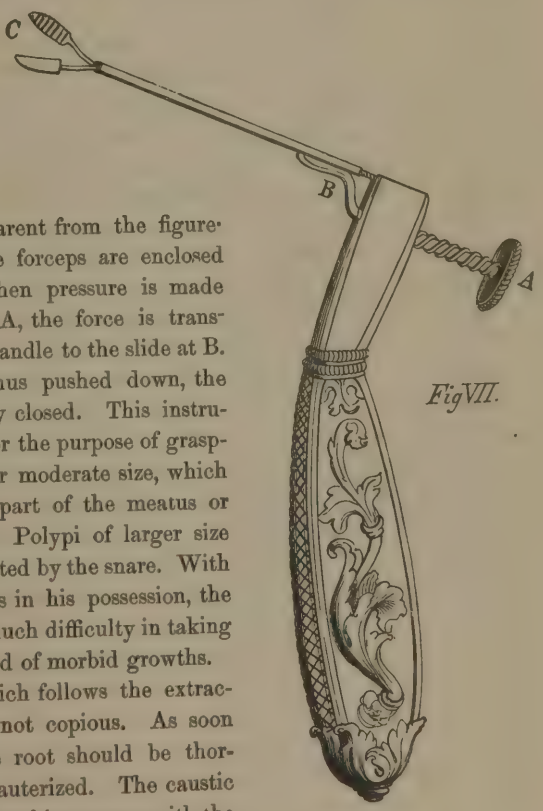


Fig VII.

Mr. Toynbee's Polypus Forceps.

The bleeding which follows the extraction of a polypus is not copious. As soon as it has ceased, the root should be thoroughly and deeply cauterized. The caustic which I have used for this purpose with the most success, is the solid nitrate of silver. Mr. Toynbee recommends the potassa fusa, or the *potassa cum calce*. But I have been

unwilling to introduce into the ear a caustic which is so violent in its action and deliquesces so rapidly as caustic potash. The nitrate of silver may be very easily applied by means of the following simple instrument, represented in Fig. 8. It consists merely of a piece of platina wire, inserted into a handle. The free extremity of the wire is made rough, or perforated with small holes, so as to prevent the caustic from slipping off. Nitrate of silver can be easily fused around this point, and moulded to any size that the operator may desire. A piece of silver coin may be used upon which to melt the caustic. By this simple caustic holder, nitrate of silver can be readily applied to any part of the meatus. If the operator desires to do so, he can bend the wire so as to facilitate his manipulations.

Fig VIII

Porte Caustique for the Ear.

By the aid of this instrument, or by some other means, the root of the polypus should be thoroughly cauterized. In many instances, the disposition to reproduction is obstinate, and can be overcome only by great perseverance on the part of both the patient and the surgeon. I have sometimes found it necessary, for the eradication of a polypus, to employ a curved bistoury, and divide the tissues from which the polypus sprung, by a crucial incision, and then to thrust the caustic in every direction into the divided parts. The caustic should be applied every second or third day, until the tendency to reproduction is overcome. At the same time, while this treatment is going on, the meatus should be kept scrupulously clean. For this purpose, nothing is so good as frequent syringing with tepid water. It is likewise important to instil into the passage several times a day some astringent wash. Solutions of the acetate of lead, of tannin, of alum, and of the sulphate of copper, may all be used with advantage. The application of caustic and the use of any wash, should be discontinued as soon as the polypus ceases to reäppear. Sometimes, though rarely, this treatment causes pain. If the pain is slight, it may be disregarded: but if it is severe, or long continued, it is well to put a blister behind the ear, or to apply one or two leeches to the orifice of the meatus. It is occasionally necessary to keep a blister open for some little time. The after treatment, which I have described, is much more important after the extraction of epithelial polypi, than after those of a fibrous character.

The treatment of fungus growths differs in one particular essentially,

from that of polypi. It is not well to attempt the destruction of the former by extraction. When seized by an instrument, they break up under its grasp; so that only the portion grasped can be torn away. Moreover, the bleeding surface grows more rapidly after it has been torn than before it was meddled with. They should be freely touched with caustic, either in solution or in solid form, every two or three days, while daily instillations of astringent washes are employed. A solution of caustic can be more conveniently applied by means of fine cotton. on a delicate pair of bent forceps, than by a camel's-hair brush. Almost any strength may be used. When the vegetations are luxuriant, a solution of nitrate of silver of the strength of from 50 to 100 grains to the ounce is not too strong. When they are delicate and smaller, resembling somewhat a congested mucous membrane, a strength of from 10 to 30 grains to the ounce is sufficient.

It is important for the practitioner to remember, that fungoid growths and polypi may be either a purely local disease, or they may depend upon some constitutional taint. In the former case, a local treatment alone, such as I have just indicated, is sufficient; in the latter case, constitutional treatment must be likewise attended to. If the patient is of a scrofulous diathesis, chalybeates or preparations of iodine, like the iodide of potassium, should be exhibited. When the root of a polypus reaches down to, or springs from the periosteum, I have found the iodide of potassium of great advantage in hastening the cure. When the patient is of plethoric make, mild alteratives, like the blue pill combined with rhubarb, or some other gentle cathartic, should be given occasionally. When caries of the bone exists, the same general treatment should be instituted that caries demands in any other part of the body. If there is any reason to suspect that polypus growths are connected with the internal ear, or complicated with any cerebral disease, the treatment previously indicated should be used with extreme caution, if at all. Very grave results may follow meddling with a polypus that implicates the brain. There are always symptoms, however, of a suspicious character, to warn the surgeon of any such complication. If no such symptoms are present, active treatment for the removal of polypus may be safely instituted. And, indeed, an urgent reason for commencing this treatment, is the fact that a neglected polypus may lead to fatal disease of the brain.

It was my intention to append several cases of polypus and fungus, in illustration of these remarks; but the length which this article has already attained, precludes me from doing so. This must be reserved for another occasion.